WHAT IS CLAIMED IS:

1. A preamble for a wireless communications system, the preamble comprising a sequence wherein the sequence comprises a concatenation of a first set of sub-sequences, with each sub-sequence containing a specified number of zeroes, and wherein each sub-sequence can differ depending upon its position in the preamble.

2. The preamble of claim 1, wherein the sub-sequences may be specified in the time domain.

3. The preamble of claim 1 further comprising a second sequence wherein the second sequence comprises a concatenation of a second set of sub-sequences, wherein the second set of sub-sequences can differ from the first set of sub-sequences.

4. The preamble of claim 3, wherein the second sequence comprises a concatenation of multiple copies of a frequency domain sequence.

5. The preamble of claim 4, wherein the frequency domain sequence is converted into a time domain sequence prior to use in creating the second sequence.

6. The preamble of claim 5, wherein the second sequence comprises six (6) copies of the time domain sequence version of the frequency domain sequence.

7. The preamble of claim 4, wherein the frequency domain sequence is specified as follows:

Tone Number	Value	Tone Number	Value	Tone Number	Value	Tone Number	Value
-56	$(1-j)/\sqrt{2}$	-28	$(1-j)/\sqrt{2}$	1	$(1+j)/\sqrt{2}$	29	$(1+j)/\sqrt{2}$
-55	$(-1+j)/\sqrt{2}$	-27	$(1-j)/\sqrt{2}$	2	$-(1+j)/\sqrt{2}$	30	$-(1+j)/\sqrt{2}$
-54	$(-1+j)/\sqrt{2}$	-26	$(-1+j)/\sqrt{2}$	3	$(1+j)/\sqrt{2}$	31	$-(1+j)/\sqrt{2}$

-53	$(1-j)/\sqrt{2}$	-25	$(-1+j)/\sqrt{2}$	4	$-(1+j)/\sqrt{2}$	32	$(1+j)/\sqrt{2}$
-52	$(1-j)/\sqrt{2}$	-24	$(-1+j)/\sqrt{2}$	5	$-(1+j)/\sqrt{2}$	33	$-(1+j)/\sqrt{2}$
-51	$(1-j)/\sqrt{2}$	-23	$(1-j)/\sqrt{2}$	6	$-(1+j)/\sqrt{2}$	34	$-(1+j)/\sqrt{2}$
-50	$(-1+j)/\sqrt{2}$	-22	$(-1+j)/\sqrt{2}$	7	$-(1+j)/\sqrt{2}$	35	$-(1+j)/\sqrt{2}$
-49	$(1-j)/\sqrt{2}$	-21	$(-1+j)/\sqrt{2}$	8	$-(1+j)/\sqrt{2}$	36	$(1+j)/\sqrt{2}$
-48	$(-1+j)/\sqrt{2}$	-20	$(1-j)/\sqrt{2}$	9	$(1+j)/\sqrt{2}$	37	$-(1+j)/\sqrt{2}$
-47	$(-1+j)/\sqrt{2}$	-19	$(-1+j)/\sqrt{2}$	10	$(1+j)/\sqrt{2}$	38	$(1+j)/\sqrt{2}$
-46	$(-1+j)/\sqrt{2}$	-18	$(-1+j)/\sqrt{2}$	11	$(1+j)/\sqrt{2}$	39	$-(1+j)/\sqrt{2}$
-45	$(1-j)/\sqrt{2}$	-17	$(-1+j)/\sqrt{2}$	12	$-(1+j)/\sqrt{2}$	40	$-(1+j)/\sqrt{2}$
-44	$(-1+j)/\sqrt{2}$	-16	$(-1+j)/\sqrt{2}$	13	$(1+j)/\sqrt{2}$	41	$-(1+j)/\sqrt{2}$
-43	$(-1+j)/\sqrt{2}$	-15	$(1-j)/\sqrt{2}$	14	$-(1+j)/\sqrt{2}$	42	$-(1+j)/\sqrt{2}$
-42	$(-1+j)/\sqrt{2}$	-14	$(-1+j)/\sqrt{2}$	15	$(1+j)/\sqrt{2}$	43	$-(1+j)/\sqrt{2}$
-41	$(-1+j)/\sqrt{2}$	-13	$(1-j)/\sqrt{2}$	16	$-(1+j)/\sqrt{2}$	44	$-(1+j)/\sqrt{2}$
-40	$(-1+j)/\sqrt{2}$	-12	$(-1+j)/\sqrt{2}$	17	$-(1+j)/\sqrt{2}$	45	$(1+j)/\sqrt{2}$
-39	$(-1+j)/\sqrt{2}$	-11	$(1-j)/\sqrt{2}$	18	$-(1+j)/\sqrt{2}$	46	$-(1+j)/\sqrt{2}$
-38	$(1-j)/\sqrt{2}$	-10	$(1-j)/\sqrt{2}$	19	$-(1+j)/\sqrt{2}$	47	$-(1+j)/\sqrt{2}$
-37	$(-1+j)/\sqrt{2}$	-9	$(1-j)/\sqrt{2}$	20	$(1+j)/\sqrt{2}$	48	$-(1+j)/\sqrt{2}$
-36	$(1-j)/\sqrt{2}$	-8	$(-1+j)/\sqrt{2}$	21	$-(1+j)/\sqrt{2}$	49	$(1+j)/\sqrt{2}$
-35	$(-1+j)/\sqrt{2}$	-7	$(-1+j)/\sqrt{2}$	22	$-(1+j)/\sqrt{2}$	50	$-(1+j)/\sqrt{2}$
-34	$(-1+j)/\sqrt{2}$	-6	$(-1+j)/\sqrt{2}$	23	$(1+j)/\sqrt{2}$	51	$(1+j)/\sqrt{2}$
-33	$(-1+j)/\sqrt{2}$	-5	$(-1+j)/\sqrt{2}$	24	$-(1+j)/\sqrt{2}$	52	$(1+j)/\sqrt{2}$
-32	$(1-j)/\sqrt{2}$	-4	$(-1+j)/\sqrt{2}$	25	$-(1+j)/\sqrt{2}$	53	$(1+j)/\sqrt{2}$
-31	$(-1+j)/\sqrt{2}$	-3	$(1-j)/\sqrt{2}$	26	$-(1+j)/\sqrt{2}$	54	$-(1+j)/\sqrt{2}$
-30	$(-1+j)/\sqrt{2}$	-2	$(-1+j)/\sqrt{2}$	27	$(1+j)/\sqrt{2}$	55	$-(1+j)/\sqrt{2}$
-29	$(1-j)/\sqrt{2}$	-1	$(1-j)/\sqrt{2}$	28	$(1+j)/\sqrt{2}$	56	$(1+j)/\sqrt{2}$

8. The preamble of claim 4, wherein the frequency domain sequence is specified as follows:

Tone Number	Value	Tone Number	Value	Tone Number	Value	Tone Number	Value
-56	1	-28	1	1	1	29	1
-55	-1	-27	-1	2	1	30	1
-54	-1	-26	1	3	1	31	1
-53	1	-25	1	4	1	32	1
-52	-1	-24	1	5	1	33	-1

-51	-1	-23	-1	6	-1	34	-1
-50	1	-22	1	7	-1	35	-1
-49	1	-21	-1	8	1	36	1
-48	-1	-20	1	9	1	37	-1
-47	1	-19	-1	10	1	38	-1
-46	-1	-18	-1	11	-1	39	-1
-45	-1	-17	1	12	1	40	1
-44	-1	-16	-1	13	1	41	1
-43	1	-15	-1	14	-1	42	-1
-42	-1	-14	-1	15	-1	43	1
-41	1	-13	1	16	-1	44	-1
-40	1	-12	1	17	1	45	-1
-39	-1	-11	-1	18	-1	46	-1
-38	-1	-10	1	19	-1	47	1
-37	-1	-9	1	20	1	48	-1
-36	1	-8	1	21	-1	49	1
-35	-1	-7	-1	22	1	50	1
-34	-1	-6	-1	23	-1	51	-1
-33	-1	-5	1	24	1	52	-1
-32	1	-4	1	25	1	53	1
-31	1	-3	1	26	1	54	-1
-30	1	-2	1	27	-1	55	-1
-29	1	-1	1	28	1	56	1

9. The preamble of claim 1, wherein the first sequence comprises:

a third sequence wherein the third sequence comprises a concatenation of multiple copies of a first sub-sequence; and

a fourth sequence wherein the fourth sequence comprises a concatenation of multiple copies of a fifth sequence comprising 180-degree rotations of each member of the first sub-sequence.

10. The preamble of claim 9, wherein the first sub-sequence is a hierarchical sequence.

11. The preamble of claim 10, wherein the first sub-sequence is created by spreading a first hierarchical sequence with a second hierarchical sequence, wherein the two hierarchical sequences are shorter than the first sub-sequence.

12. The preamble of claim 11, wherein the first hierarchical sequence is a sequence selected from:

Sequence																
#1	1	1	1	1	-1	-1	1	1	-1	-1	1	-1	1	-1	1	1
#2	1	-1	-1	-1	-1	-1	1	-1	1	-1	-1	1	1	-1	-1	1
#3	1	1	-1	-1	-1	1	-1	-1	-1	1	-1	-1	1	-1	1	1
#4	1	-1	-1	1	-1	1	-1	-1	1	1	-1	-1	-1	-1	-1	1

13. The preamble of claim 11, wherein the second hierarchical sequence is a sequence selected from:

Sequence								
#1	1	-1	-1	-1	1	1	-1	1
#2	1	-1	1	1	-1	-1	-1	1
#3	1	1	-1	1	1	-1	-1	-1
#4	1	1	1	-1	-1	1	-1	-1

14. The preamble of claim 11, wherein the time domain sequence is specified as follows:

Sequence Element	Value	Sequence Element	Value	Sequence Element	Value	Sequence Element	Value
C_0	1	C_{32}	-1	C_{64}	-1	C_{96}	1
C_1	-1	C_{33}	1	C_{65}	1	C_{97}	-1
C_2	-1	C_{34}	1	C_{66}	1	C_{98}	-1
C_3	-1	C_{35}	1	C_{67}	1	C_{99}	-1
C_4	1	C_{36}	-1	C_{68}	-1	C_{100}	1
C_5	1	C_{37}	-1	C_{69}	-1	C_{101}	1
C_6	-1	C_{38}	1	C_{70}	1	C_{102}	-1
C_7	1	C_{39}	-1	C_{71}	-1	C_{103}	1
C_8	1	C_{40}	-1	C_{72}	-1	C_{104}	-1
C_9	-1	C_{41}	1	C_{73}	1	C_{105}	1
C_{10}	-1	C_{42}	1	C_{74}	1	C_{106}	1
C_{11}	-1	C_{43}	1	C_{75}	1	C_{107}	1
C_{12}	1	C_{44}	-1	C_{76}	-1	C_{108}	-1
C_{13}	1	C_{45}	-1	C_{77}	-1	C_{109}	-1
C_{14}	-1	C_{46}	1	C_{78}	1	C_{110}	1
C_{15}	1	C_{47}	-1	C_{79}	-1	C_{111}	-1
C_{16}	1	C_{48}	1	C_{80}	1	C_{112}	1
C_{17}	-1	C_{49}	-1	C_{81}	-1	C_{113}	-1

C_{18}	-1	C_{50}	-1	C_{82}	-1	C_{114}	-1
C_{19}	-1	C_{51}	-1	C_{83}	-1	C_{115}	-1
C_{20}	1	C_{52}	1	C_{84}	1	C_{116}	1
C_{21}	1	C_{53}	1	C_{85}	1	C_{117}	1
C_{22}	-1	C_{54}	-1	C_{86}	-1	C_{118}	-1
C_{23}	1	C_{55}	1	C_{87}	1	C_{119}	1
C_{24}	1	C_{56}	1	C_{88}	-1	C_{120}	1
C_{25}	-1	C_{57}	-1	C_{89}	1	C_{121}	-1
C_{26}	-1	C_{58}	-1	C_{90}	1	C_{122}	-1
C_{27}	-1	C_{59}	-1	C_{91}	1	C_{123}	-1
C_{28}	1	C_{60}	1	C_{92}	-1	C_{124}	1
C_{29}	1	C_{61}	1	C_{93}	-1	C_{125}	1
C_{30}	-1	C_{62}	-1	C_{94}	1	C_{126}	-1
C_{31}	1	C_{63}	1	C_{95}	-1	C_{127}	1

15. The preamble of claim 11, wherein the time domain sequence is specified as follows:

Sequence Element	Value	Sequence Element	Value	Sequence Element	Value	Sequence Element	Value
C_0	1	C_{32}	-1	C_{64}	1	C_{96}	1
C_1	-1	C_{33}	1	C_{65}	-1	C_{97}	-1
C_2	1	C_{34}	-1	C_{66}	1	C_{98}	1
C_3	1	C_{35}	-1	C_{67}	1	C_{99}	1
C_4	-1	C_{36}	1	C_{68}	-1	C_{100}	-1
C_5	-1	C_{37}	1	C_{69}	-1	C_{101}	-1
C_6	-1	C_{38}	1	C_{70}	-1	C_{102}	-1
C_7	1	C_{39}	-1	C_{71}	1	C_{103}	1
C_8	-1	C_{40}	-1	C_{72}	-1	C_{104}	-1
C_9	1	C_{41}	1	C_{73}	1	C_{105}	1
C_{10}	-1	C_{42}	-1	C_{74}	-1	C_{106}	-1
C_{11}	-1	C_{43}	-1	C_{75}	-1	C_{107}	-1
C_{12}	1	C_{44}	1	C_{76}	1	C_{108}	1
C_{13}	1	C_{45}	1	C_{77}	1	C_{109}	1
C_{14}	1	C_{46}	1	C_{78}	-1	C_{110}	1
C_{15}	-1	C_{47}	-1	C_{79}	-1	C_{111}	-1
C_{16}	-1	C_{48}	1	C_{80}	-1	C_{112}	-1
C_{17}	1	C_{49}	-1	C_{81}	1	C_{113}	1
C_{18}	-1	C_{50}	1	C_{82}	-1	C_{114}	-1
C_{19}	-1	C_{51}	1	C_{83}	-1	C_{115}	-1
C_{20}	1	C_{52}	-1	C_{84}	1	C_{116}	1
C_{21}	1	C_{53}	-1	C_{85}	1	C_{117}	1
C_{22}	1	C_{54}	-1	C_{86}	1	C_{118}	1
C_{23}	-1	C_{55}	1	C_{87}	-1	C_{119}	-1
C_{24}	-1	C_{56}	-1	C_{88}	1	C_{120}	1

C_{25}	1	C_{57}	1	C_{89}	-1	C_{121}	-1
C_{26}	-1	C_{58}	-1	C_{90}	1	C_{122}	1
C_{27}	-1	C_{59}	-1	C_{91}	1	C_{123}	1
C_{28}	1	C_{60}	1	C_{92}	-1	C_{124}	-1
C_{29}	1	C_{61}	1	C_{93}	-1	C_{125}	-1
C_{30}	1	C_{62}	1	C_{94}	-1	C_{126}	-1
C_{31}	-1	C_{63}	-1	C_{95}	1	C_{127}	1

16. The preamble of claim 11, wherein the time domain sequence is specified as follows:

Sequence Element	Value	Sequence Element	Value	Sequence Element	Value	Sequence Element	Value
C_0	1	C_{32}	-1	C_{64}	-1	C_{96}	1
C_1	1	C_{33}	-1	C_{65}	-1	C_{97}	1
C_2	-1	C_{34}	1	C_{66}	1	C_{98}	-1
C_3	1	C_{35}	-1	C_{67}	-1	C_{99}	1
C_4	1	C_{36}	-1	C_{68}	-1	C_{100}	1
C_5	-1	C_{37}	1	C_{69}	1	C_{101}	-1
C_6	-1	C_{38}	1	C_{70}	1	C_{102}	-1
C_7	-1	C_{39}	1	C_{71}	1	C_{103}	-1
C_8	1	C_{40}	1	C_{72}	1	C_{104}	-1
C_9	1	C_{41}	1	C_{73}	1	C_{105}	-1
C_{10}	-1	C_{42}	-1	C_{74}	-1	C_{106}	1
C_{11}	1	C_{43}	1	C_{75}	1	C_{107}	-1
C_{12}	1	C_{44}	1	C_{76}	1	C_{108}	-1
C_{13}	-1	C_{45}	-1	C_{77}	-1	C_{109}	1
C_{14}	-1	C_{46}	-1	C_{78}	-1	C_{110}	1
C_{15}	-1	C_{47}	-1	C_{79}	-1	C_{111}	1
C_{16}	-1	C_{48}	-1	C_{80}	-1	C_{112}	1
C_{17}	-1	C_{49}	-1	C_{81}	-1	C_{113}	1
C_{18}	1	C_{50}	1	C_{82}	1	C_{114}	-1
C_{19}	-1	C_{51}	-1	C_{83}	-1	C_{115}	1
C_{20}	-1	C_{52}	-1	C_{84}	-1	C_{116}	1
C_{21}	1	C_{53}	1	C_{85}	1	C_{117}	-1
C_{22}	1	C_{54}	1	C_{86}	1	C_{118}	-1
C_{23}	1	C_{55}	1	C_{87}	1	C_{119}	-1
C_{24}	-1	C_{56}	-1	C_{88}	-1	C_{120}	1
C_{25}	-1	C_{57}	-1	C_{89}	-1	C_{121}	1
C_{26}	1	C_{58}	1	C_{90}	1	C_{122}	-1
C_{27}	-1	C_{59}	-1	C_{91}	-1	C_{123}	1
C_{28}	-1	C_{60}	-1	C_{92}	-1	C_{124}	1
C_{29}	1	C_{61}	1	C_{93}	1	C_{125}	-1
C_{30}	1	C_{62}	1	C_{94}	1	C_{126}	-1
C_{31}	1	C_{63}	1	C_{95}	1	C_{127}	-1

17. The preamble of claim 11, wherein the time domain sequence is specified as follows:

Sequence Element	Value	Sequence Element	Value	Sequence Element	Value	Sequence Element	Value
C_0	1	C_{32}	-1	C_{64}	1	C_{96}	-1
C_1	1	C_{33}	-1	C_{65}	1	C_{97}	-1
C_2	1	C_{34}	-1	C_{66}	1	C_{98}	-1
C_3	-1	C_{35}	1	C_{67}	-1	C_{99}	1
C_4	-1	C_{36}	1	C_{68}	-1	C_{100}	1
C_5	1	C_{37}	-1	C_{69}	1	C_{101}	-1
C_6	-1	C_{38}	1	C_{70}	-1	C_{102}	1
C_7	-1	C_{39}	1	C_{71}	-1	C_{103}	1
C_8	-1	C_{40}	1	C_{72}	1	C_{104}	-1
C_9	-1	C_{41}	1	C_{73}	1	C_{105}	-1
C_{10}	-1	C_{42}	1	C_{74}	1	C_{106}	-1
C_{11}	1	C_{43}	-1	C_{75}	-1	C_{107}	1
C_{12}	1	C_{44}	-1	C_{76}	-1	C_{108}	1
C_{13}	-1	C_{45}	1	C_{77}	1	C_{109}	-1
C_{14}	1	C_{46}	-1	C_{78}	-1	C_{110}	1
C_{15}	1	C_{47}	-1	C_{79}	-1	C_{111}	1
C_{16}	-1	C_{48}	-1	C_{80}	-1	C_{112}	-1
C_{17}	-1	C_{49}	-1	C_{81}	-1	C_{113}	-1
C_{18}	-1	C_{50}	-1	C_{82}	-1	C_{114}	-1
C_{19}	1	C_{51}	1	C_{83}	1	C_{115}	1
C_{20}	1	C_{52}	1	C_{84}	1	C_{116}	1
C_{21}	-1	C_{53}	-1	C_{85}	-1	C_{117}	-1
C_{22}	1	C_{54}	1	C_{86}	1	C_{118}	1
C_{23}	1	C_{55}	1	C_{87}	1	C_{119}	1
C_{24}	1	C_{56}	-1	C_{88}	-1	C_{120}	1
C_{25}	1	C_{57}	-1	C_{89}	-1	C_{121}	1
C_{26}	1	C_{58}	-1	C_{90}	-1	C_{122}	1
C_{27}	-1	C_{59}	1	C_{91}	1	C_{123}	-1
C_{28}	-1	C_{60}	1	C_{92}	1	C_{124}	-1
C_{29}	1	C_{61}	-1	C_{93}	-1	C_{125}	1
C_{30}	-1	C_{62}	1	C_{94}	1	C_{126}	-1
C_{31}	-1	C_{63}	1	C_{95}	1	C_{127}	-1

18. The preamble of claim 9, wherein the third sequence comprises multiple copies of the first sub-sequence combined with a guard band.

19. The preamble of claim 18, wherein the third sequence comprises multiple copies of the first sub-sequence with a postpended guard band and a prepended sequence.

20. The preamble of claim 19, wherein the third sequence comprises twenty one (21) copies of the first sub-sequence with a postpended guard band and a prepended sequence.

21. The preamble of claim 19, wherein the third sequence comprises nine (9) copies of the first sub-sequence with a postpended guard band and a prepended sequence.

22. The preamble of claim 19, wherein the guard band comprises a sequence of five (5) zero samples.

23. The preamble of claim 19, wherein the prepended sequence is a zero-padded sequence.

24. The preamble of claim 19, wherein the prepended sequence is a cyclic prefix.

25. The preamble of claim 9, wherein the fourth sequence comprises multiple copies of the fifth sequence combined with a guard band.

26. The preamble of claim 25, wherein the fourth sequence comprises three (3) copies of the fifth sequence with a postpended guard band and a prepended sequence.

27. The preamble of claim 9, wherein the third sequence comprises multiple concatenated copies of the first sub-sequence, wherein the fourth sequence comprises multiple concatenated copies of the fifth sequence, and wherein the third and fourth sequences are interleaved.

28. The preamble of claim 27, wherein the preamble is used in a communications system that changes transmit frequency based on a transmit code, and wherein the length of the interleaved third and fourth sequence is an integer multiple of a period of the transmit code.

29. The preamble of claim 1, wherein the wireless communications system uses orthogonal frequency division multiple access.

30. The preamble of claim 29, wherein the wireless communications system is a time-frequency interleaved, orthogonal frequency division multiple access communications system.

31. The preamble of claim 1, wherein the preamble can be transformed prior to transmission.

32. The preamble of claim 31, wherein the transformation comprises a time-domain filtering.

33. The preamble of claim 31, wherein the transformation comprises:

a first domain conversion;

processing the domain converted preamble; and

a second domain conversion.

34. The preamble of claim 33, wherein the processing comprises magnitude clipping, and wherein the time domain sequence after the second domain conversion is specified as follows:

Sequence Element	Value	Sequence Element	Value	Sequence Element	Value	Sequence Element	Value
C_0	0.6564	C_{32}	-0.0844	C_{64}	-0.2095	C_{96}	0.4232
C_1	-1.3671	C_{33}	1.1974	C_{65}	1.1640	C_{97}	-1.2684
C_2	-0.9958	C_{34}	1.2261	C_{66}	1.2334	C_{98}	-1.8151
C_3	-1.3981	C_{35}	1.4401	C_{67}	1.5338	C_{99}	-1.4829
C_4	0.8481	C_{36}	-0.5988	C_{68}	-0.8844	C_{100}	1.0302
C_5	1.0892	C_{37}	-0.4675	C_{69}	-0.3857	C_{101}	0.9419
C_6	-0.8621	C_{38}	0.8520	C_{70}	0.7730	C_{102}	-1.1472
C_7	1.1512	C_{39}	-0.8922	C_{71}	-0.9754	C_{103}	1.4858
C_8	0.9602	C_{40}	-0.5603	C_{72}	-0.2315	C_{104}	-0.6794
C_9	-1.3581	C_{41}	1.1886	C_{73}	0.5579	C_{105}	0.9573
C_{10}	-0.8354	C_{42}	1.1128	C_{74}	0.4035	C_{106}	1.0807
C_{11}	-1.3249	C_{43}	1.0833	C_{75}	0.4248	C_{107}	1.1445
C_{12}	1.0964	C_{44}	-0.9073	C_{76}	-0.3359	C_{108}	-1.2312
C_{13}	1.3334	C_{45}	-1.6227	C_{77}	-0.9914	C_{109}	-0.6643
C_{14}	-0.7378	C_{46}	1.0013	C_{78}	0.5975	C_{110}	0.3836

C_{15}	1.3565	C_{47}	-1.6067	C_{79}	-0.8408	C_{111}	-1.1482
C_{16}	0.9361	C_{48}	0.3360	C_{80}	0.3587	C_{112}	-0.0353
C_{17}	-0.8212	C_{49}	-1.3136	C_{81}	-0.9604	C_{113}	-0.6747
C_{18}	-0.2662	C_{50}	-1.4448	C_{82}	-1.0002	C_{114}	-1.1653
C_{19}	-0.6866	C_{51}	-1.7238	C_{83}	-1.1636	C_{115}	-0.8896
C_{20}	0.8437	C_{52}	1.0287	C_{84}	0.9590	C_{116}	0.2414
C_{21}	1.1237	C_{53}	0.6100	C_{85}	0.7137	C_{117}	0.1160
C_{22}	-0.3265	C_{54}	-0.9237	C_{86}	-0.6776	C_{118}	-0.6987
C_{23}	1.0511	C_{55}	1.2618	C_{87}	0.9824	C_{119}	0.4781
C_{24}	0.7927	C_{56}	0.5974	C_{88}	-0.5454	C_{120}	0.1821
C_{25}	-0.3363	C_{57}	-1.0976	C_{89}	1.1022	C_{121}	-1.0672
C_{26}	-0.1342	C_{58}	-0.9776	C_{90}	1.6485	C_{122}	-0.9676
C_{27}	-0.1546	C_{59}	-0.9982	C_{91}	1.3307	C_{123}	-1.2321
C_{28}	0.6955	C_{60}	0.8967	C_{92}	-1.2852	C_{124}	0.5003
C_{29}	1.0608	C_{61}	1.7640	C_{93}	-1.2659	C_{125}	0.7419
C_{30}	-0.1600	C_{62}	-1.0211	C_{94}	0.9435	C_{126}	-0.8934
C_{31}	0.9442	C_{63}	1.6913	C_{95}	-1.6809	C_{127}	0.8391

35. The preamble of claim 33, wherein the processing comprises magnitude clipping, and wherein the time domain sequence after the second domain conversion is specified as follows:

Sequence Element	Value	Sequence Element	Value	Sequence Element	Value	Sequence Element	Value
C_0	0.9679	C_{32}	-1.2905	C_{64}	1.5280	C_{96}	0.5193
C_1	-1.0186	C_{33}	1.1040	C_{65}	-0.9193	C_{97}	-0.3439
C_2	0.4883	C_{34}	-1.2408	C_{66}	1.1246	C_{98}	0.1428
C_3	0.5432	C_{35}	-0.8062	C_{67}	1.2622	C_{99}	0.6251
C_4	-1.4702	C_{36}	1.5425	C_{68}	-1.4406	C_{100}	-1.0468
C_5	-1.4507	C_{37}	1.0955	C_{69}	-1.4929	C_{101}	-0.5798
C_6	-1.1752	C_{38}	1.4284	C_{70}	-1.1508	C_{102}	-0.8237
C_7	-0.0730	C_{39}	-0.4593	C_{71}	0.4126	C_{103}	0.2667
C_8	-1.2445	C_{40}	-1.0408	C_{72}	-1.0462	C_{104}	-0.9563
C_9	0.3143	C_{41}	1.0542	C_{73}	0.7232	C_{105}	0.6016
C_{10}	-1.3951	C_{42}	-0.4446	C_{74}	-1.1574	C_{106}	-0.9964
C_{11}	-0.9694	C_{43}	-0.7929	C_{75}	-0.7102	C_{107}	-0.3541
C_{12}	0.4563	C_{44}	1.6733	C_{76}	0.8502	C_{108}	0.3965
C_{13}	0.3073	C_{45}	1.7568	C_{77}	0.6260	C_{109}	0.5201
C_{14}	0.6408	C_{46}	1.3273	C_{78}	0.9530	C_{110}	0.4733
C_{15}	-0.9798	C_{47}	-0.2465	C_{79}	-0.4971	C_{111}	-0.2362
C_{16}	-1.4116	C_{48}	1.6850	C_{80}	-0.8633	C_{112}	-0.6892
C_{17}	0.6038	C_{49}	-0.7091	C_{81}	0.6910	C_{113}	0.4787
C_{18}	-1.3860	C_{50}	1.1396	C_{82}	-0.3639	C_{114}	-0.2605
C_{19}	-1.0888	C_{51}	1.5114	C_{83}	-0.8874	C_{115}	-0.5887

C_{20}	1.1036	C_{52}	-1.4343	C_{84}	1.5311	C_{116}	0.9411
C_{21}	0.7067	C_{53}	-1.5005	C_{85}	1.1546	C_{117}	0.7364
C_{22}	1.1667	C_{54}	-1.2572	C_{86}	1.1935	C_{118}	0.6714
C_{23}	-1.0225	C_{55}	0.8274	C_{87}	-0.2930	C_{119}	-0.1746
C_{24}	-1.2471	C_{56}	-1.5140	C_{88}	1.3285	C_{120}	1.1776
C_{25}	0.7788	C_{57}	1.1421	C_{89}	-0.7231	C_{121}	-0.8803
C_{26}	-1.2716	C_{58}	-1.0135	C_{90}	1.2832	C_{122}	1.2542
C_{27}	-0.8745	C_{59}	-1.0657	C_{91}	0.7878	C_{123}	0.5111
C_{28}	1.2175	C_{60}	1.4073	C_{92}	-0.8095	C_{124}	-0.8209
C_{29}	0.8419	C_{61}	1.8196	C_{93}	-0.7463	C_{125}	-0.8975
C_{30}	1.2881	C_{62}	1.1679	C_{94}	-0.8973	C_{126}	-0.9091
C_{31}	-0.8210	C_{63}	-0.4131	C_{95}	0.5560	C_{127}	0.2562

36. The preamble of claim 33, wherein the processing comprises magnitude clipping, and wherein the time domain sequence after the second domain conversion is specified as follows:

Sequence Element	Value	Sequence Element	Value	Sequence Element	Value	Sequence Element	Value
C_0	0.4047	C_{32}	-0.9671	C_{64}	-0.7298	C_{96}	0.2424
C_1	0.5799	C_{33}	-0.9819	C_{65}	-0.9662	C_{97}	0.5703
C_2	-0.3407	C_{34}	0.7980	C_{66}	0.9694	C_{98}	-0.6381
C_3	0.4343	C_{35}	-0.8158	C_{67}	-0.8053	C_{99}	0.7861
C_4	0.0973	C_{36}	-0.9188	C_{68}	-0.9052	C_{100}	0.9175
C_5	-0.7637	C_{37}	1.5146	C_{69}	1.5933	C_{101}	-0.4595
C_6	-0.6181	C_{38}	0.8138	C_{70}	0.8418	C_{102}	-0.2201
C_7	-0.6539	C_{39}	1.3773	C_{71}	1.5363	C_{103}	-0.7755
C_8	0.3768	C_{40}	0.2108	C_{72}	0.3085	C_{104}	-0.2965
C_9	0.7241	C_{41}	0.9245	C_{73}	1.3016	C_{105}	-1.1220
C_{10}	-1.2095	C_{42}	-1.2138	C_{74}	-1.5546	C_{106}	1.7152
C_{11}	0.6027	C_{43}	1.1252	C_{75}	1.5347	C_{107}	-1.2756
C_{12}	0.4587	C_{44}	0.9663	C_{76}	1.0935	C_{108}	-0.7731
C_{13}	-1.3879	C_{45}	-0.8418	C_{77}	-0.8978	C_{109}	1.0724
C_{14}	-1.0592	C_{46}	-0.6811	C_{78}	-0.9712	C_{110}	1.1733
C_{15}	-1.4052	C_{47}	-1.3003	C_{79}	-1.3763	C_{111}	1.4711
C_{16}	-0.8439	C_{48}	-0.3397	C_{80}	-0.6360	C_{112}	0.4881
C_{17}	-1.5992	C_{49}	-1.1051	C_{81}	-1.2947	C_{113}	0.7528
C_{18}	1.1975	C_{50}	1.2400	C_{82}	1.6436	C_{114}	-0.6417
C_{19}	-1.9525	C_{51}	-1.3975	C_{83}	-1.6564	C_{115}	1.0363
C_{20}	-1.5141	C_{52}	-0.7467	C_{84}	-1.1981	C_{116}	0.8002
C_{21}	0.7219	C_{53}	0.2706	C_{85}	0.8719	C_{117}	-0.0077
C_{22}	0.6982	C_{54}	0.7294	C_{86}	0.9992	C_{118}	-0.2336
C_{23}	1.2924	C_{55}	0.7444	C_{87}	1.4872	C_{119}	-0.4653
C_{24}	-0.9460	C_{56}	-0.3970	C_{88}	-0.4586	C_{120}	0.6862

C_{25}	-1.2407	C_{57}	-1.0718	C_{89}	-0.8404	C_{121}	1.2716
C_{26}	0.4572	C_{58}	0.6646	C_{90}	0.6982	C_{122}	-0.8880
C_{27}	-1.2151	C_{59}	-1.1037	C_{91}	-0.7959	C_{123}	1.4011
C_{28}	-0.9869	C_{60}	-0.5716	C_{92}	-0.5692	C_{124}	0.9531
C_{29}	1.2792	C_{61}	0.9001	C_{93}	1.3528	C_{125}	-1.1210
C_{30}	0.6882	C_{62}	0.7317	C_{94}	0.9536	C_{126}	-0.9489
C_{31}	1.2586	C_{63}	0.9846	C_{95}	1.1784	C_{127}	-1.2566

37. The preamble of claim 33, wherein the processing comprises magnitude clipping, and wherein the time domain sequence after the second domain conversion is specified as follows:

Sequence Element	Value	Sequence Element	Value	Sequence Element	Value	Sequence Element	Value
C_0	1.1549	C_{32}	-1.2385	C_{64}	1.3095	C_{96}	-1.0094
C_1	1.0079	C_{33}	-0.7883	C_{65}	0.6675	C_{97}	-0.7598
C_2	0.7356	C_{34}	-0.7954	C_{66}	1.2587	C_{98}	-1.0786
C_3	-0.7434	C_{35}	1.0874	C_{67}	-0.9993	C_{99}	0.6699
C_4	-1.3930	C_{36}	1.1491	C_{68}	-1.0052	C_{100}	0.9813
C_5	1.2818	C_{37}	-1.4780	C_{69}	0.6601	C_{101}	-0.5563
C_6	-1.1033	C_{38}	0.8870	C_{70}	-1.0228	C_{102}	1.0548
C_7	-0.2523	C_{39}	0.4694	C_{71}	-0.7489	C_{103}	0.8925
C_8	-0.7905	C_{40}	1.5066	C_{72}	0.5086	C_{104}	-1.3656
C_9	-0.4261	C_{41}	1.1266	C_{73}	0.1563	C_{105}	-0.8472
C_{10}	-0.9390	C_{42}	0.9935	C_{74}	0.0673	C_{106}	-1.3110
C_{11}	0.4345	C_{43}	-1.2462	C_{75}	-0.8375	C_{107}	1.1897
C_{12}	0.4433	C_{44}	-1.7869	C_{76}	-1.0746	C_{108}	1.5127
C_{13}	-0.3076	C_{45}	1.7462	C_{77}	0.4454	C_{109}	-0.7474
C_{14}	0.5644	C_{46}	-1.4881	C_{78}	-0.7831	C_{110}	1.4678
C_{15}	0.2571	C_{47}	-0.4090	C_{79}	-0.3623	C_{111}	1.0295
C_{16}	-1.0030	C_{48}	-1.4694	C_{80}	-1.3658	C_{112}	-0.9210
C_{17}	-0.7820	C_{49}	-0.7923	C_{81}	-1.0854	C_{113}	-0.4784
C_{18}	-0.4064	C_{50}	-1.4607	C_{82}	-1.4923	C_{114}	-0.5022
C_{19}	0.9034	C_{51}	-0.9113	C_{83}	0.4233	C_{115}	1.2153
C_{20}	1.5406	C_{52}	0.8454	C_{84}	0.6741	C_{116}	1.5783
C_{21}	-1.4613	C_{53}	-0.8866	C_{85}	-1.0157	C_{117}	-0.7718
C_{22}	1.2745	C_{54}	0.8852	C_{86}	0.8304	C_{118}	1.2384
C_{23}	0.3715	C_{55}	0.4918	C_{87}	0.4878	C_{119}	0.6695
C_{24}	1.8134	C_{56}	-0.6096	C_{88}	-1.4992	C_{120}	0.8821
C_{25}	0.9438	C_{57}	-0.4321	C_{89}	-1.1884	C_{121}	0.7807
C_{26}	1.3130	C_{58}	-0.1327	C_{90}	-1.4008	C_{122}	1.0537
C_{27}	-1.3070	C_{59}	0.4953	C_{91}	0.7795	C_{123}	-0.0791
C_{28}	-1.3462	C_{60}	0.9702	C_{92}	1.2926	C_{124}	-0.2845
C_{29}	1.6868	C_{61}	-0.8667	C_{93}	-1.2049	C_{125}	0.5790

C_{30}	-1.2153	C_{62}	0.6803	C_{94}	1.2934	C_{126}	-0.4664
C_{31}	-0.6778	C_{63}	-0.0244	C_{95}	0.8123	C_{127}	-0.1097

38. The preamble of claim 31, wherein the preamble can be transformed prior to use and stored in a memory.

39. A method for distinguishing multiple piconets, wherein each piconet transmits a preamble with a unique code sequence, the method comprising:

determining the code sequence in the preamble; and

identifying the piconet based on the code sequence, wherein the code sequence maps onto a unique piconet identifier.

40. The method of claim 39, wherein the determining comprises extracting the code sequence used to create the preamble.

41. The method of claim 40, wherein the code sequence is a hierarchical code, wherein the code sequence can be created by spreading a first sequence with a second sequence, and wherein the extracting comprises:

despreading the preamble with the second sequence; and

despreading an output of the first despreading with the first sequence.

42. The method of claim 41, wherein the first sequence is an M-length sequence, wherein the second sequence is an N-length sequence, and wherein the second despreading comprises despreading every N-th chip produced by the first despreading with the first sequence.

43. The method of claim 40, wherein the code sequence is a hierarchical code, wherein the code sequence can be created by spreading a first sequence with a second sequence, and wherein the extracting comprises:

despreading the preamble with the first sequence; and

despreading an output of the first despreading with the second sequence.

44. The method of claim 43, wherein the first sequence is an M-length sequence, wherein the second sequence is an N-length sequence, and wherein the first despreading comprises despreading every N-th chip of the preamble with the first sequence.

45. The method of claim 39, wherein the identifying comprises using a look-up table indexed by the code sequence to find the source of the preamble.

46. The method of claim 39, wherein the identifying comprises searching a list of sources and their associated code sequences to find the source of the preamble.

47. A circuit to despread a hierarchical sequence made by spreading an M-length sequence with an N-length sequence, the circuit comprising:

a first despreader coupled to a signal input, the first despreader to despread a received signal provided by the signal input with a first sequence; and

a second despreader coupled to an output of the first despreader, the second despreader to despread the output of the first despreader with a second sequence.

48. The circuit of claim 47, wherein the first and second despreader comprises:

a serially coupled chain of delay elements, wherein a first delay element is coupled to an input;

a plurality of multipliers, wherein each multiplier having a first input coupled to an output of one delay element and a second input coupled to a coefficient of the first sequence; and

a summation unit coupled to outputs of each multiplier, the summation unit to combine the outputs of each multiplier to produce a value.

49. The circuit of claim 48, wherein a first multiplier in the plurality of multipliers has a first input coupled to the input.

50. The circuit of claim 48, wherein the first sequence is the N-length sequence and the second sequence is the M-length sequence, and wherein the first despreader has N-1 delay elements and N multipliers and the second despreader has M-1 delay elements and M multipliers.

51. The circuit of claim 50, wherein the delay elements of the second despreader have a delay of N and the delay elements of the first despreader have unity delay.

52. The circuit of claim 48, wherein the first sequence is the M-length sequence and the second sequence is the N-length sequence, and wherein the first despreader has M-1 delay elements and M multipliers and the second despreader has N-1 delay elements and N multipliers.

53. The circuit of claim 52, wherein the delay elements of the first despreader have a delay of N and the delay elements of the second despreader have unity delay.

54. The circuit of claim 47, wherein the circuit is used in a wireless receiver.

55. The circuit of claim 54, wherein the wireless receiver is part of a wireless communications system wherein transmissions include a preamble that makes use of a hierarchical sequence.

56. The circuit of claim 55, wherein the wireless receiver is part of a wireless communications system using orthogonal frequency division multiplexing.

57. The circuit of claim 55, wherein the wireless receiver is part of a wireless communications system using time frequency interleaved, orthogonal frequency division multiplexing.